Amendments to the Drawings:

The attached sheet of drawings includes changes to Fig. 4. This sheet, which includes Fig. 4, replaces the original sheet including Fig. 4. In Fig. 4, the previously omitted reference character **26** of the element "**POWER AMPLIFIER**" has been added. No new matter is added.

Attachment: Annotated Sheet Showing Changes

Replacement Sheet

REMARKS/ARGUMENTS

Examiner Pham is thanked for the thorough examination of the subject Patent Application. The Claims have been carefully reviewed and amended, and are considered to be in condition for allowance.

Reconsideration of the rejection under 35 USC §103(a) of Claims 1, 3-4, 6, 8, 10-12,15-16, 20, 22-23, and 25 as being unpatentable over in by U.S. Patent Publication Number 2003/0064684 (Zinn) in view of U. S. Patent 4,059,807 (Hamada) is requested in light of the following arguments. Zinn does describe an encoder that provides a rudimentary pulse width modulation. An input signal is compared with a sense voltage that is determined in a voltage divider having a variable impedance. The trigger point is based on level of the sense voltage. Hamada does describe a pulse width modulated amplifier where an input is combined with a feedback signal from an output and a differential signal is integrated and pulse width modulated. Neither Zinn, nor Hamada, nor the combination of Zinn and Hamada teach to:

> a pulse width amplifier to receive an audio signal and modulate a pulse width of a digital timing signal with said audio signal, such that the pulse width is proportional to an amplitude of said audio signal to provide a pulse width modulated signal; (Claim 1, Lines 3-7)

an integrator in communication with the down-converter to receive the extracted pulse width modulated signal to remove a timing signal from said extracted pulse width modulated signal to restore the audio signal. (Claim 1, Lines 17-20)

a pulse width amplifier to receive an audio signal and modulate a pulse width of a digital timing signal with said audio signal, such that the pulse width is proportional to an amplitude of said audio signal to provide a pulse width modulated signal; (Claim 10, Lines 2-6)

an up-converter in communication with the pulse width amplifier to receive the pulse width modulated signal and convert said pulse width modulated signal to a modulated carrier signal; (Claim 10, Lines 7-9) and

a transmitter in communication with the modulated carrier signal to transfer the modulated carrier signal wirelessly. (Claim 10, Lines 10-11)

A method for wireless transmission of an audio signal comprising the steps of:

acquiring the audio signal;

comparing said audio signal with a timing signal;

from said comparing, forming a pulse width modulated signal; and (Claim 20, Lines 1-5)

integrating the restored pulse width modulated signal to remove a timing signal from said restored pulse width modulated signal to extract said audio signal. (Claim 20, Lines 12-14)

Zinn provides an apparatus to "encode and/or decode a predefined signature for actuator-based transceiver systems" (Para. [0023]), such as signals for "activating and deactivating car alarms and building alarms, and signaling automatic garage door openers" (Para. [0023]). These signals are "a triangle wave signal, a sinusoidal signal and other such signals" (Para. [0024]). The input triangle or sinusoidal are compared to a reference voltage $\mathbf{V_{Sense}}$ (Figs. 1 and 3) that is modified by adjusting a variable impedance $\mathbf{R_V}$. There is no teaching to the variation of the variable impedance for adjusting the reference voltage $\mathbf{V_{Sense}}$. In the pulse width modulation of this invention, the local oscillator signal is a triangle wave that acts as the reference for developing the "Class D" modulated signal of the input audio signal. This is not shown in Zinn.

Zinn does provide a transmitter where the "modulated output signal 132 is mixed-up by the transmitter 164 to a desired transmit frequency" (Para. [0026]). The applicant presumes that the Examiner is interpreting the meaning of "mixed-up" to be a modulation of a transmission frequency signal by the pulse width modulated frequency. The applicant believes that this is not entirely clear. In

super-hetrodyne transmission, the base frequency modulates a much higher frequency in a "mixer". In the transmitter of this invention the frequency of the local oscillator is multiplied by a higher transmission frequency signal **F0**. This is not shown in Zinn.

Hamada shows a pulse width modulator, but the signal that is modulated is a differential of an input audio signal and a feedback signal. There is no discussion of a transmitter and receiver. In fact Hamada teaches away from a transmitter in that the feedback signal is generated at the output load (Fig. 1).

The integrator 222 as discussed in paragraph [0030] of Zinn "receives the modulated signal 132. The integrator generates an average DC voltage 224 proportional to the duty cycle of the modulated signal 132, where the duty cycle is proportional to the select voltage." While a low pass filter is required to generate the DC voltage, there is no teaching to removing a timing signal from a pulse width modulated signal to restore an audio signal. As noted by the Examiner, Zinn does not teach to or imply a pulse width amplifier. Hamada teaches only to the pulse width amplifier and does not teach the integrator for removing the timing signal to restore the audio signal.

There is no teaching in Zinn to suggest the pulse width amplifier and it is not obvious that the transmitter is employs a frequency multiplication for the up conversion from the local oscillator frequency to the fundamental transmission frequency. Hamada does not provide teaching to suggest the up-converter and

transmitter. Therefore, the applicant does not believe that the combination is obvious.

The invention as claimed in amended Claims 1, 3-4, 6, 8, 10-12,15-16, 20, 22-23, and 25 is believed to be novel and patentable over Zinn, Hamada, or Zinn in combination with Hamada because there is not sufficient basis for concluding that the combination of claimed elements would have been obvious to one skilled in the art. That is to say, there must be something in the prior art or line of reasoning to suggest that the combination of these various references is desirable. The applicant believes that there is no such basis for the combination. The applicant therefore requests Examiner Pham reconsider the rejection in view of these arguments.

Reconsideration of the rejection under 35 USC §103(a) of Claims 2 and 21 as being unpatentable over in by U.S. Patent Publication Number 2003/0064684 (Zinn) in view of U. S. Patent 4,059,807 (Hamada) and further in view of U.S. Patent Publication Number 2003/0017840 (Katagishi, et al.) is requested in light of the following arguments. As described above, Zinn does describe a decoder apparatus that is part of a receiver having a receiver frequency demodulator or receiver mixer to compensate or down convert for the frequency modulation of the transmitter. The output of the frequency demodulator is coupled with the integrator. Hamada does describe a pulse width modulated amplifier. Katagishi, et al. does describe the use of an "acoustic transducer 600 includes a speaker 620 and a microphone 640" and a filter 126 in

a cellular telephone. However, neither Zinn, nor Hamada, nor Katagishi, et al., nor the combination of Zinn, Hamada, and Katagishi, et al. teach to:

a pulse width amplifier to receive an audio signal and modulate a pulse width of a digital timing signal with said audio signal, such that the pulse width is proportional to an amplitude of said audio signal to provide a pulse width modulated signal; (Claim 1, Lines 3-7)

an integrator in communication with the down-converter to receive the extracted pulse width modulated signal to remove a timing signal from said extracted pulse width modulated signal to restore the audio signal. (Claim 1, Lines 17-20)

A method for wireless transmission of an audio signal comprising the steps of:

acquiring the audio signal;

comparing said audio signal with a timing signal;

from said comparing, forming a pulse width modulated signal; and (Claim 20, Lines 1-5)

integrating the restored pulse width modulated signal to remove a timing signal from said restored pulse width modulated signal to extract said audio signal. (Claim 20, Lines 12-14)

As described above, Zinn provides an apparatus to "encode and/or decode a predefined signature for actuator-based transceiver systems" (Para. [0023]), such as signals for "activating and deactivating car alarms and building alarms, and signaling automatic garage door openers" (Para. [0023]). These signals are "a triangle wave signal, a sinusoidal signal and other such signals" (Para. [0024]). The input triangle or sinusoidal are compared to a reference voltage $\mathbf{V}_{\mathbf{Sense}}$ (Figs. 1 and 3) that is modified by adjusting a variable impedance $\mathbf{R}_{\mathbf{V}}$. There is no teaching to the variation of the variable impedance for adjusting the reference voltage $\mathbf{V}_{\mathbf{Sense}}$. In the pulse width modulation of this invention, the local oscillator signal is a triangle wave that acts as the reference for developing the "Class D" modulated signal of the input audio signal. This is not shown in Zinn.

Zinn does provide a transmitter where the "modulated output signal 132 is mixed-up by the transmitter 164 to a desired transmit frequency" (Para. [0026]). The applicant presumes that the Examiner is interpreting the meaning of "mixed-up" to be a modulation of a transmission frequency signal by the pulse width modulated frequency. The applicant believes that this is not entirely clear. In super-hetrodyne transmission, the base frequency modulates a much higher frequency in a "mixer". In the transmitter of this invention the frequency of the

local oscillator is multiplied by a higher transmission frequency signal **F0**. This is not shown in Zinn.

Hamada shows a pulse width modulator, but the signal that is modulated is a differential of an input audio signal and a feedback signal. There is no discussion of a transmitter and receiver. In fact Hamada teaches away from a transmitter in that the feedback signal is generated at the output load (Fig. 1).

The integrator 222 as discussed in paragraph [0030] of Zinn "receives the modulated signal 132. The integrator generates an average DC voltage 224 proportional to the duty cycle of the modulated signal 132, where the duty cycle is proportional to the select voltage." While a low pass filter is required to generate the DC voltage, there is no teaching to removing a timing signal from a pulse width modulated signal to restore an audio signal. As noted by the Examiner, Zinn does not teach to or imply a pulse width amplifier. Hamada teaches only to the pulse width amplifier and does not teach the integrator for removing the timing signal to restore the audio signal.

Katagishi, et al. teaches to a receiver that includes input amplifiers, filters, a down-converter, an amplifier, a quadrature demodulator (QDEM), and a base band demodulator 160. Katagishi, et al. does not teach to the integrator for removing the timing signal to restore the audio signal. Further, Katagishi, et al. does not provide a power amplifier in communication with the integrator to amplify the audio signal to drive a transducer (speaker). The band pass filter 126

does not necessarily amplify the audio signal and in fact may attenuate the power of the signal.

The invention as claimed in amended Claims 2 and 21 is believed to be novel and patentable over Zinn, Hamada, Katagishi, et al., or Zinn in combination with Hamada and Katagishi, et al. because there is not sufficient basis for concluding that the combination of claimed elements would have been obvious to one skilled in the art. That is to say, there must be something in the prior art or line of reasoning to suggest that the combination of these various references is desirable. The applicant believes that there is no such basis for the combination. The applicant therefore requests Examiner Pham reconsider the rejection in view of these arguments.

Reconsideration of the rejection under 35 USC §103(a) of Claims 17, and 19 as being unpatentable over in by U.S. Patent Publication Number 2003/0064684 (Zinn) in view of U. S. Patent 6,690,949 (Shamlou et al.) is requested in light of the following arguments. As described above, Zinn does describe a decoder apparatus that is part of a receiver having a receiver frequency demodulator or receiver mixer to compensate or down convert for the frequency modulation of the transmitter. The output of the frequency demodulator is coupled with the integrator. Shamlou et al. does discuss a demodulator that employs Quadrature Phase Shift Key, Differential Quadrature Phase Shift, Amplitude Shift Keying and Frequency Shift Keying demodulation

schemes. Neither Zinn, nor Shamlou et al., nor Zinn in combination with Shamlou et al. discusses:

> an integrator in communication with the down-converter to receive the extracted pulse width modulated signal to remove a timing signal from said extracted pulse width modulated signal to restore an audio signal. (Claim 15, Lines 8-11)

As described above, Zinn provides an apparatus to "encode and/or decode a predefined signature for actuator-based transceiver systems" (Para. [0023]), such as signals for "activating and deactivating car alarms and building alarms, and signaling automatic garage door openers" (Para. [0023]). These signals are "a triangle wave signal, a sinusoidal signal and other such signals" (Para. [0024]). The input triangle or sinusoidal are compared to a reference voltage $\mathbf{V_{Sense}}$ (Figs. 1 and 3) that is modified by adjusting a variable impedance $\mathbf{R_V}$. There is no teaching to the variation of the variable impedance for adjusting the reference voltage $\mathbf{V_{Sense}}$. In the pulse width modulation of this invention, the local oscillator signal is a triangle wave that acts as the reference for developing the "Class D" modulated signal of the input audio signal. This is not shown in Zinn.

Zinn does provide a transmitter where the "modulated output signal 132 is mixed-up by the transmitter 164 to a desired transmit frequency" (Para. [0026]). The applicant presumes that the Examiner is interpreting the meaning of "mixed-

up" to be a modulation of a transmission frequency signal by the pulse width modulated frequency. The applicant believes that this is not entirely clear. In super-hetrodyne transmission, the base frequency modulates a much higher frequency in a "mixer". In the transmitter of this invention the frequency of the local oscillator is multiplied by a higher transmission frequency signal **F0**. This is not shown in Zinn.

Hamada shows a pulse width modulator, but the signal that is modulated is a differential of an input audio signal and a feedback signal. There is no discussion of a transmitter and receiver. In fact Hamada teaches away from a transmitter in that the feedback signal is generated at the output load (Fig. 1).

The integrator 222 as discussed in paragraph [0030] of Zinn "receives the modulated signal 132. The integrator generates an average DC voltage 224 proportional to the duty cycle of the modulated signal 132, where the duty cycle is proportional to the select voltage." While a low pass filter is required to generate the DC voltage, there is no teaching to removing a timing signal from a pulse width modulated signal to restore an audio signal. As noted by the Examiner, Zinn does not teach to or imply a pulse width amplifier. Hamada teaches only to the pulse width amplifier and does not teach the integrator for removing the timing signal to restore the audio signal. There is no suggestion in Shamlou et al. for removal of a timing signal from a pulse width modulated signal to restore an audio signal.

The invention as claimed in amended Claims 17 and 19 is believed to be novel and patentable over Zinn, Shamlou et al., or Zinn in combination with Shamlou et al., because there is not sufficient basis for concluding that the combination of claimed elements would have been obvious to one skilled in the art. That is to say, there must be something in the prior art or line of reasoning to suggest that the combination of these various references is desirable. The applicant believes that there is no such basis for the combination. The applicant therefore requests Examiner Pham reconsider the rejection in view of these arguments.

Reconsideration of the rejection under 35 USC §103(a) of Claims 5, 7, 9, 13-14, 24, 26, and 27 as being unpatentable over in by U.S. Patent Publication Number 2003/0064684 (Zinn) in view of U. S. Patent 4,059,807 (Hamada) and further in view of U. S. Patent 6,690,949 (Shamlou et al.) is requested in light of the following arguments. As described above, Zinn does describe a decoder apparatus that is part of a receiver having a receiver frequency demodulator or receiver mixer to compensate or down convert for the frequency modulation of the transmitter. The output of the frequency demodulator is coupled with the integrator. Hamada does describe a pulse width modulated amplifier. Shamlou et al. does discuss a demodulator that employs Quadrature Phase Shift Key, Differential Quadrature Phase Shift, Amplitude Shift Keying and Frequency Shift Keying demodulation schemes. However, with regards to Claims 5, 7, 9, 24, 26,

and 27 neither Zinn, nor Hamada, nor Shamlou et al., nor the combination of Zinn, Hamada, and Shamlou et al. teach to:

> a pulse width amplifier to receive an audio signal and modulate a pulse width of a digital timing signal with said audio signal, such that the pulse width is proportional to an amplitude of said audio signal to provide a pulse width modulated signal; (Claim 1, Lines 3-7)

> an integrator in communication with the down-converter to receive the extracted pulse width modulated signal to remove a timing signal from said extracted pulse width modulated signal to restore the audio signal. (Claim 1, Lines 17-20)

> a pulse width amplifier to receive an audio signal and modulate a pulse width of a digital timing signal with said audio signal, such that the pulse width is proportional to an amplitude of said audio signal to provide a pulse width modulated signal; (Claim 10, Lines 2-6)

> an up-converter in communication with the pulse width amplifier to receive the pulse width modulated signal and convert said pulse width modulated signal to a modulated carrier signal; (Claim 10, Lines 7-9) and

a transmitter in communication with the modulated carrier signal to transfer the modulated carrier signal wirelessly. (Claim 10, Lines 10-11)

A method for wireless transmission of an audio signal comprising the steps of:

acquiring the audio signal;

comparing said audio signal with a timing signal;

from said comparing, forming a pulse width modulated signal; and (Claim 20, Lines 1-5)

integrating the restored pulse width modulated signal to remove a timing signal from said restored pulse width modulated signal to extract said audio signal. (Claim 20, Lines 12-14)

As described above, Zinn provides an apparatus to "encode and/or decode a predefined signature for actuator-based transceiver systems" (Para. [0023]), such as signals for "activating and deactivating car alarms and building alarms, and signaling automatic garage door openers" (Para. [0023]). These signals are "a triangle wave signal, a sinusoidal signal and other such signals" (Para. [0024]). The input triangle or sinusoidal are compared to a reference voltage $\mathbf{V_{Sense}}$ (Figs. 1 and 3) that is modified by adjusting a variable impedance $\mathbf{R_V}$. There is no teaching to the variation of the variable impedance for adjusting

the reference voltage V_{Sense}. In the pulse width modulation of this invention, the local oscillator signal is a triangle wave that acts as the reference for developing the "Class D" modulated signal of the input audio signal. This is not shown in Zinn.

Zinn does provide a transmitter where the "modulated output signal 132 is mixed-up by the transmitter 164 to a desired transmit frequency" (Para. [0026]). The applicant presumes that the Examiner is interpreting the meaning of "mixed-up" to be a modulation of a transmission frequency signal by the pulse width modulated frequency. The applicant believes that this is not entirely clear. In super-hetrodyne transmission, the base frequency modulates a much higher frequency in a "mixer". In the transmitter of this invention the frequency of the local oscillator is multiplied by a higher transmission frequency signal **F0**. This is not shown in Zinn.

Hamada shows a pulse width modulator, but the signal that is modulated is a differential of an input audio signal and a feedback signal. There is no discussion of a transmitter and receiver. In fact Hamada teaches away from a transmitter in that the feedback signal is generated at the output load (Fig. 1).

The integrator 222 as discussed in paragraph [0030] of Zinn "receives the modulated signal 132. The integrator generates an average DC voltage 224 proportional to the duty cycle of the modulated signal 132, where the duty cycle is proportional to the select voltage." While a low pass filter is required to

generate the DC voltage, there is no teaching to removing a timing signal from a pulse width modulated signal to restore an audio signal. As noted by the Examiner, Zinn does not teach to or imply a pulse width amplifier. Hamada teaches only to the pulse width amplifier and does not teach the integrator for removing the timing signal to restore the audio signal. There is no suggestion in Shamlou et al. for removal of a timing signal from a pulse width modulated signal to restore an audio signal.

There is no teaching in Zinn and Shamlou et al. to suggest the pulse width amplifier and in Hamada to suggest the up-converter and transmitter. Therefore, the applicant does not believe that the combination is obvious.

The invention as claimed in amended Claims 5, 7, 9, 13-14, 24, 26, and 27 is believed to be novel and patentable over Zinn, Hamada, Shamlou et al., or Zinn in combination with Hamada and Shamlou et al. because there is not sufficient basis for concluding that the combination of claimed elements would have been obvious to one skilled in the art. That is to say, there must be something in the prior art or line of reasoning to suggest that the combination of these various references is desirable. The applicant believes that there is no such basis for the combination. The applicant therefore requests Examiner Pham reconsider the rejection in view of these arguments.

Fig. 4 has been modified with the changes marked in red on the attached drawings to add the previously omitted reference character **26** of the element

"**POWER AMPLIFIER**". Approval by Examiner Pham of these changes is requested. No new matter has been added.

The applicant understands that Examiner's FINAL position re this office action and respectfully requests that a timely Notice of Allowance for all claims be issued in this case.

It is requested that should Examiner Pham not find that the Claims are now allowable, that the undersigned be called at (845) 452-5863 to overcome any problems preventing allowance.

Respectfully Submitted,
George O. Saile & Associates

Billy J Knowles

Billy J. Knowles, Reg. No. 42,752
Telephone: (845) 452-5863

Enclosures:

Appendix

Annotated Drawing Sheet Showing Changes

Annotated Sheet Showing Changes

4/4

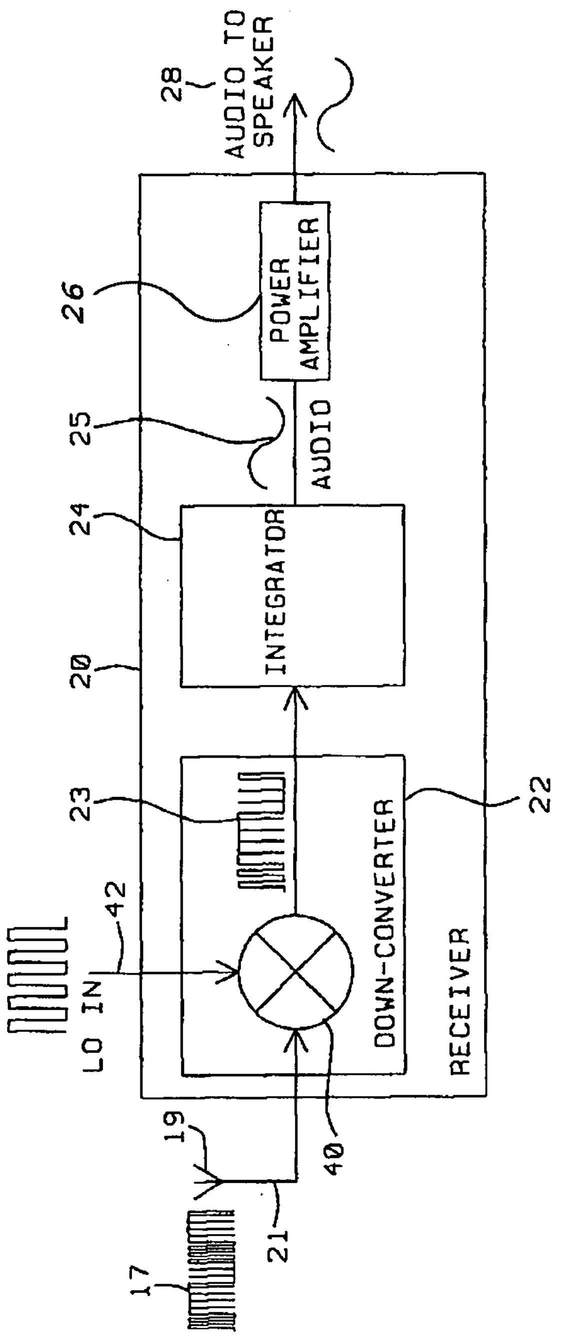

FIG. 4

Drawing Replacement Drawing Sheet(s)